

AVATEC PRINCESS

MFG BY PMC ELECTRONICS CO. INC.

Our games are designed with the customer in mind and we appreciate any and all comments from the field.

The Motorola TV and main circuit board have been designed to give you, the customer, the most trouble free unit possible. The circuits used are all solid state for long life and reliability.

In the event your unit does require servicing, this manual will aid your efforts..

This Manual consists of the following sections: :

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BEFORE INSTALLING, MAKE SURE THE GAME WILL HAVE A GROUNDED ELECTRICAL CONNECTION. IF A THREE-PRONG OUTLET IS NOT AVAILABLE, USE A COLD-WATER PIPE OR OTHER SUITABLE FIXTURE. RELYING SOLELY UPON THE TV MONITOR CHASSIS FOR "GROUND" WILL RESULT IN MARGINAL OPERATION: POOR QUALITY DISPLAY; SUSCEPTIBILITY TO ELECTRICAL NOISE FROM NEARBY GAMES, SWITCHBOARDS, PINSPOTTERS, JUKEBOXES, ETC.; INTERMITTENT LOGIC BOARD PROBLEMS; AND INCREASED SAFETY HAZARD.

CABINET MAINTENANCE

Cleaning of the cabinet may be done with any non-abrasive household cleaner. A good grade of clear commercial interior Urthane or Flex-O-Varathane, using a #4 ox brush, will cover all scratch marks. Sherman-Williams lacquer bar top spray (containing Urthane) will do the same.

PC BOARD SHIPPING PROCEDURE

Careful packing is recommended as PMC can not be liable for boards damaged in transit. When packaging PC Board for shipment, use bubble wrap, foam rubber or styrofoam to secure the board. Also include a short statement describing the basic problem with the board.

THIS SERVICE MANUAL HAS BEEN PREPARED TO AID IN RECTIFYING ANY PROBLEMS THAT MIGHT ARISE. IF ASSISTANCE IS REQUIRED PLEASE CONTACT:

PMC ELECTRONICS CO., INC.
1120 Industrial Hwy.
Southampton, PA 18966

(215) 322-2925

RULES OF PLAY

PRINCESS

PLAYERS: 1, 2, 3 or 4

The object of the game is to score while preventing your opponent from doing the same. The player or players who score 11 points or the most points in 2 1/2 minutes is the winner.

In the 1 or 3 player mode a super goalie or super racket will appear.

ADJUSTMENTS:

There are two types of adjustments that can be made to your unit: TV and CIRCUIT BOARDS.

The controls on the TV Monitor work as in any normal TV. Vertical Hold, Brightness, Contrast & Horizontal Hold. These are located on the back side of the monitor chassis. The vertical and horizontal hold controls should be set in the middle of their range. Turn control until picture tears or rolls, turn control back until picture tears or rolls in the opposite direction and then reset control to the middle of the stable range. The brightness and contrast should be set at a point where the court in the center of the playfield is clearly visible.

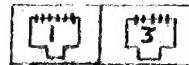
CIRCUIT BOARD:

GAME TIME: INCREASE CLOCKWISE LOOKING AT MOVEABLE
DECREASE COUNTERCLOCKWISE PORTION OF POT

OPTION: TIMER MAY BE DISABLE BY CUTTING TRACE TO PIN 7 OF
IC 555 (UNDERSIDE OF BOARD)

IC 555 IS LOCATED IN FRONT AND TO THE RIGHT OF
POTENTIOMETER.

SET POINT SCORE: SET AT 11 VARIABLE 0 TO 99
TURN TO ANY SCORE DESIRED



FREE GAME: WHEN PLUG INSERTED PROPERLY AND SCORE MATCHED
PLAYER AWARDED FREE GAME:

FREE GAME: ☐ 1 Km



REMOVE PLUG AND INSERT
TO YOUR OPTION

NO FREE GAME:



DIAGNOSIS

SYMPTOM

NO PICTURE

NO SOUND

ROLLING OR TEARING
PICTURE

GAME WILL NOT START

SYMPTOM

NUMBER PROBLEMS

PADDLE PROBLEMS

BALL PROBLEMS

COURT PROBLEM

SOUND PROBLEM

CHECK

FUSE, POWER CORD, HARNESS
CONNECTIONS

SPEAKER CONNECTIONS,
VOLUME ADJUSTMENTS

READJUST TV CONTROLS

COIN MECHANISM, HARNESS
CONNECTIONS

PROBABLE CAUSE BLOCKS

SCORE SECTION OR COURT DISPLAY
SECTION, TIMING CHAIN, COURT
DISPLAY, VIDEO OUTPUT

PADDLE GENERATOR, TIMING CHAIN,
BAD PADDLE CONTROL (POT),
BALL PADDLE COINCIDENCE, COURT
DISPLAY, VIDEO OUTPUT

BALL GENERATOR, TIMING CHAIN,
BALL WALL COINCIDENCE
BALL PADDLE COINCIDENCE
HORIZONTAL BALL SPEED
COURT DISPLAY, VIDEO OUTPUT

COURT DISPLAY, TIMING CHAIN,
VIDEO OUTPUT, TV

SOUND BLOCK, SCORE, PLAY
BALL WALL COINCIDENCE
BALL PADDLE COINCIDENCE
TV

TV TROUBLESHOOTING

NO POWER: Check for blown fuses and proper line voltage. Also check to see if the interlock switch is in the on position, either with the rear door closed or with the switch defeated.

NO PICTURE: Check the monitor fuses. If blown, visually check the monitor for shorts. If fuses are OK, look to see if the CRT's choke filament is glowing and if there are any loose wires.

WHITE PICTURE BUT NO DISPLAY: This symptom indicates two problems. Either the PC Board or the TV is malfunctioning. To double check and make certain of the area of trouble, check the PC Boards making sure power is reaching them and check the edge connectors making sure they are positioned correctly on the PC Boards. Also check the twelve (12) pin Molex connector on the TV making sure it is correctly connected.

WAVY PICTURE: If this condition exists, check the following two items to be sure they are functioning properly. First check the five (5) volt power supply on the two main circuit boards. This can be done by measuring between the two heavy traces on each board with a voltmeter or an oscilloscope. There should be $5 \pm 1/4$ volts on each board. Next, locate pin 32 on the large monitor circuit board. Measure the voltage from this pin to ground. There should be seventy-three (73) volts at this point. If the voltage is either too high or too low, adjust the 73 volt regulator pot located on the PC Board in the upper left hand corner. DO NOT TURN THIS POT THRU THE WHOLE RANGE.

Damage will occur to it's associated parts. All that needs to be done is a slight turn to adjust properly.

IMPROPER DISPLAY: Recheck all picture adjustments (brightness, contrast, etc.) to make sure they are correct.

REMOVAL & REPLACEMENT PROCEDURES

TV MONITOR REMOVAL

1. Lift top (unfasten lock)
2. 4 screws on corners (wood)
3. Lift monitor out (unfasten connections on monitor back)

TV MONITOR REPLACEMENT

To replace the TV monitor, follow in reverse order the steps for monitor removal.

MOTOROLA MONITOR PC BOARD REMOVAL

POWER, AUDIO PC BOARD: To remove this PC Board, simply locate it on the left side of the monitor in back of the power transformer. Carefully pull up on the board. To replace this board, locate the slot between Pins 3 & 4 and put this on your left side, then simply insert into the edge connector.

MOTOROLA MONITOR PC BOARD REMOVAL CONTINUED

MONITOR PC BOARD: To remove the monitor PC Board, take a screwdriver or a similar object and slowly pry the PC Board up off of the chassis until it clears the pins. Next, unplug the socket from the yoke and slide board out. To replace this board, follow the above steps in reverse order.

MAIN CIRCUIT BOARD

REMOVAL: Disconnect plug, slide board out.

Recommended tools to help service Logic Board:

1. 60 watt solder iron
2. Desoldering tool
3. Chain nose pliers 5"
4. Diagonal cutters 4"
5. Wire strippers

REPLACEMENT: Follow the reverse steps of the removal procedures to replace the PC Boards.

W A R R A N T Y

The equipment you have just purchased has been designed, tested and inspected before being shipped to you. If properly operated in accordance with the instructions furnished, it should provide you with the finest results.

This warranty shall not apply unless the equipment or part is returned to distributor nor shall it apply to equipment which has been subjected to misuse, accident or neglect.

A. The game is warranted for a period of 90 days, excluding the TV and LOGIC BOARD.

1. TV warranty 30 days.
2. Logic Board warranty 90 days.

B. After this warranty period has expired we can supply any replacement part for this equipment at a nominal charge for parts and labor.

The warranty registration card below must be filled out and mailed within ten days of purchase to place this warranty into effect. Return card to: PMC ELECTRONICS CO., INC.
1120 Industrial Hwy.
Southampton, PA 18966

WARRANTY REGISTRATION

The following equipment is hereby registered and guaranteed as described only if this card is filled in and mailed within ten days of purchase.

PURCHASER _____

STREET ADDRESS _____

CITY _____ STATE _____ ZIP _____

MODEL _____ SERIAL NO. _____

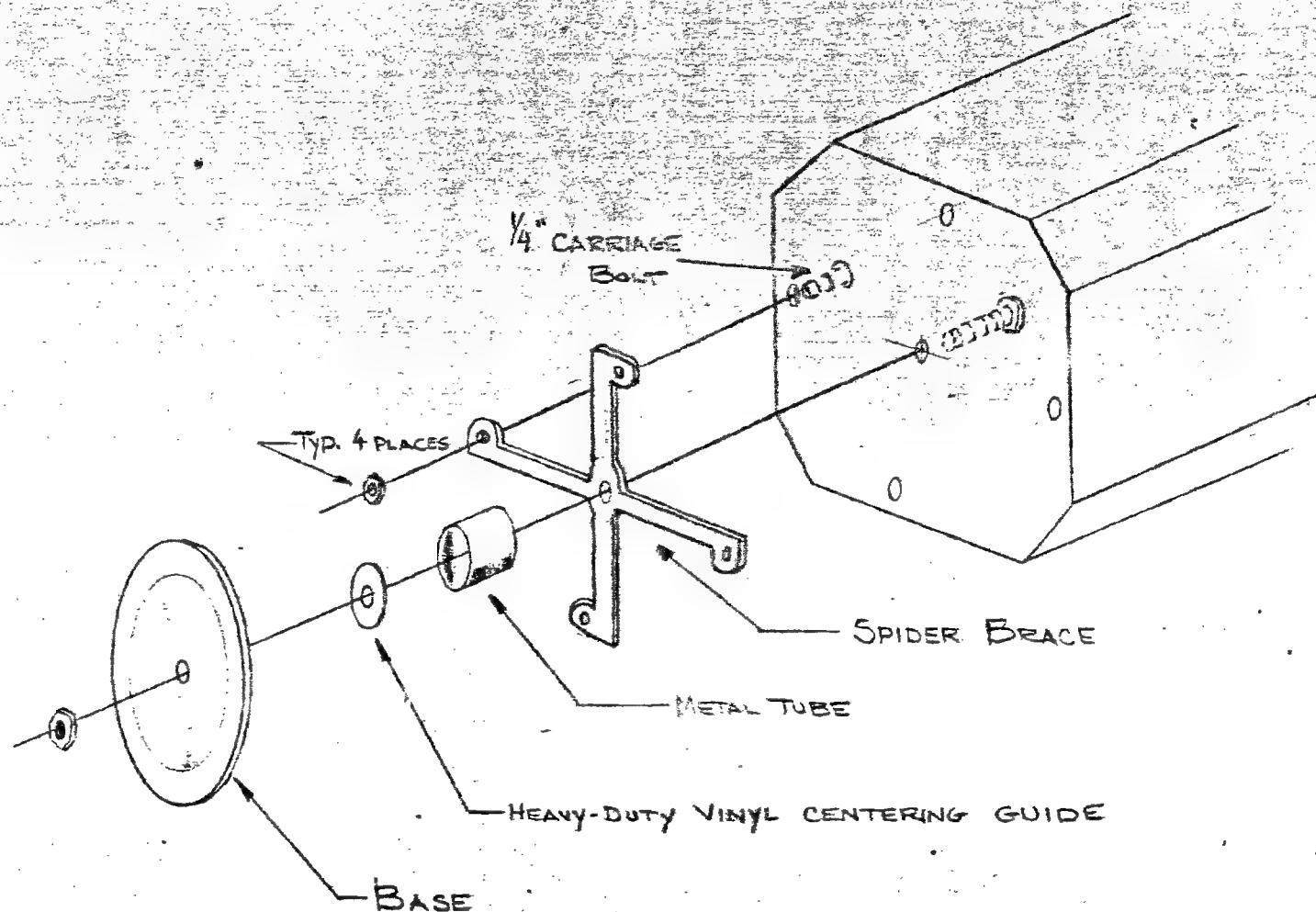
DATE OF PURCHASE _____

BOUGHT FROM _____

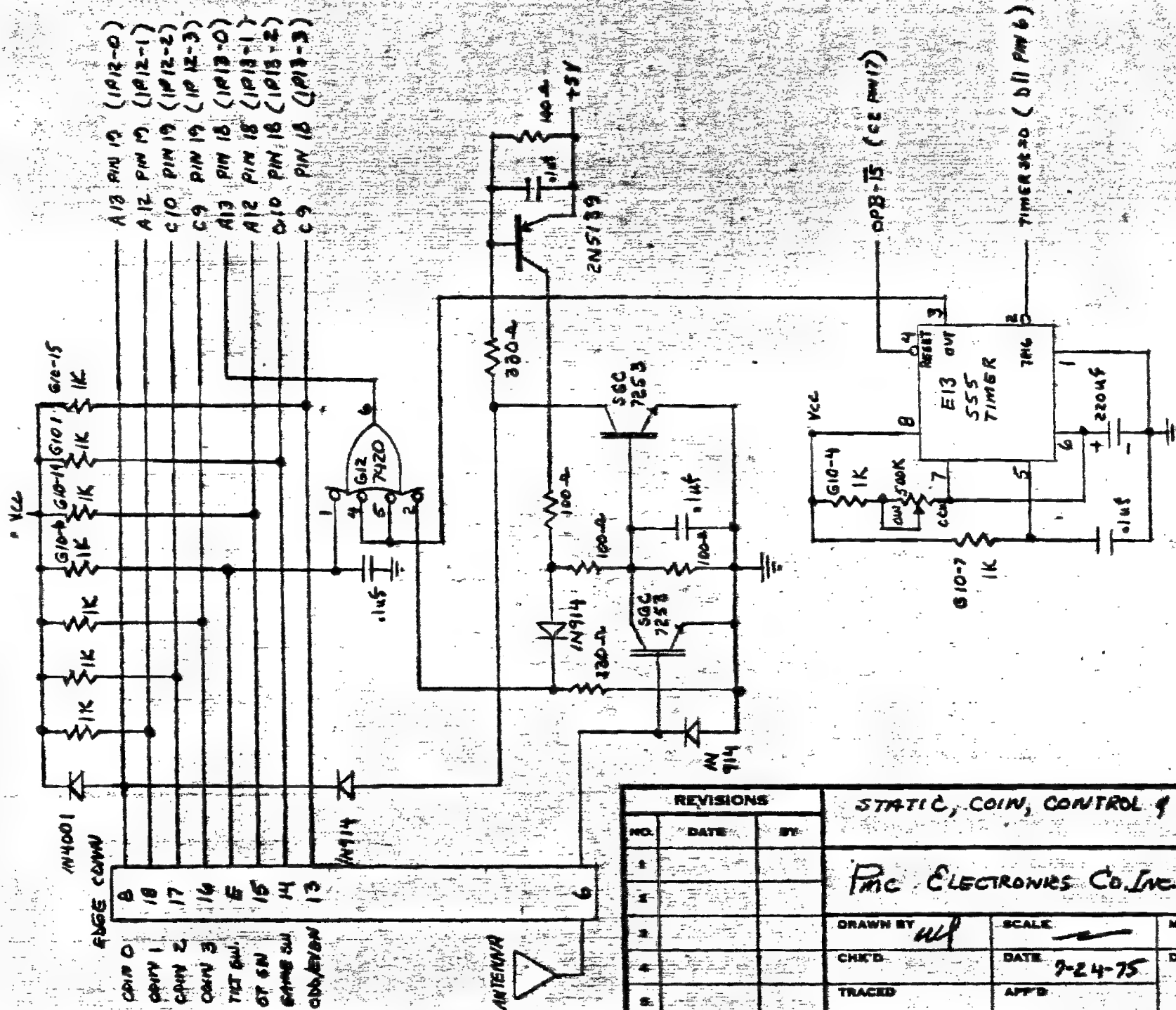
COMMENTS _____

HEIGHT:

TO CHANGE THE HEIGHT OF AZTEC, REMOVE CENTER STEEL COLLAR TUBING IN BASE, CUT OFF CONNECTING BOLT, REDUCES HEIGHT TO 26 INCHES. REMOVING ENTIRE BASE REDUCES HEIGHT TO 22 INCHES.



REVISIONS			COCKTAIL CABINET BASE ASS'Y		
NO.	DATE	BY	PMC ELECTRONICS CO INC		
1			DRAWN BY <i>B. Thomas Paul</i> SCALE <i>1/2"</i>		
2					
3			CHK'D	DATE <i>3-4-75</i>	MATERIAL
4			TRACED	APP'D	DRAWING NO.
5					<i>CC-105-A</i>



REVISIONS			STATIC, COIN, CONTROL & TIMER CKTS		
NO.	DATE	BY			
1					
2					
3					
4					
5					
			DRAWN BY	SCALE	MATERIAL
			CHK'D	DATE	DRAWING NO.
			TRACED	APP'D	

Hand-drawn circuit diagram of a 4-bit parallel adder using a 74175 4-bit shift register and four 7454 2-input AND gates.

74175 4-bit Shift Register:

- Vcc (Pin 16) is connected to the top supply rail.
- GND (Pin 8) is connected to the bottom supply rail.
- Outputs (Pins 10, 20, 30, 40) are connected to the inputs of the four 7454 AND gates.

7454 2-input AND Gates:

- Gate 1: Inputs from Pin 13 and Pin 10; Output connected to the common output line.
- Gate 2: Inputs from Pin 11 and Pin 20; Output connected to the common output line.
- Gate 3: Inputs from Pin 15 and Pin 30; Output connected to the common output line.
- Gate 4: Inputs from Pin 9 and Pin 40; Output connected to the common output line.

External Inputs:

- Pin 13: Input 122
- Pin 11: Input 244
- Pin 15: Input 488
- Pin 9: Input 976

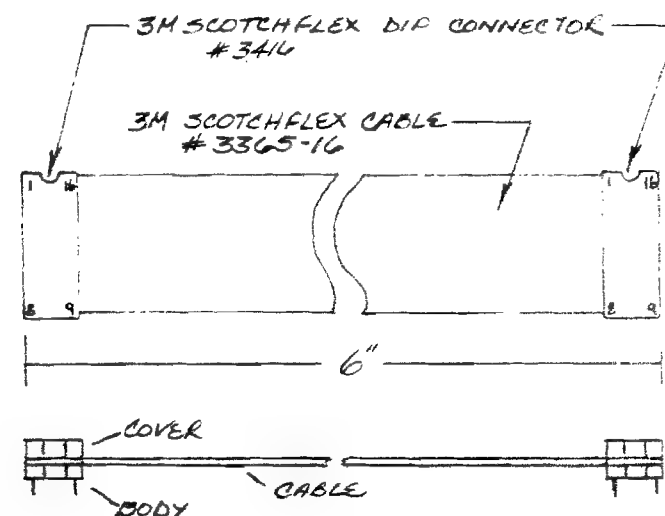
Notes:

- 16-VCC 8-GND
- 122, 244, 488, 976 (Input values)

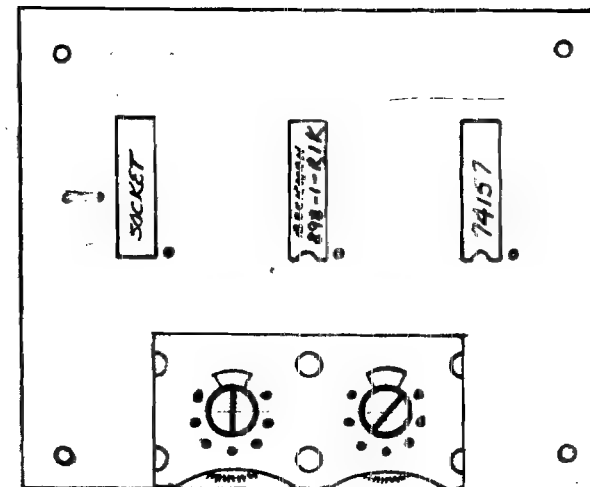
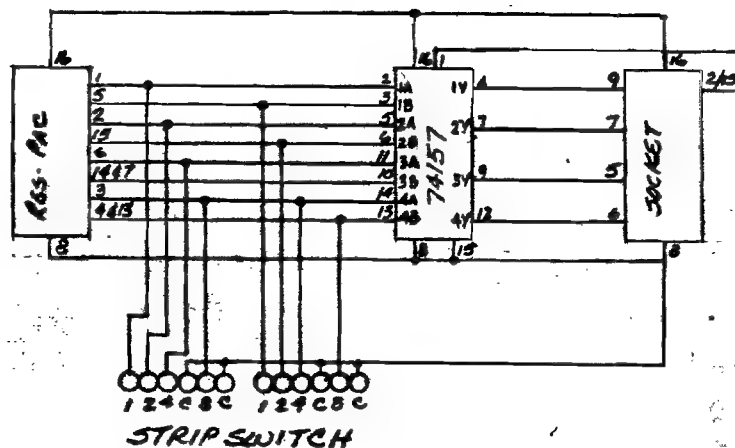
16 PIN
SOCKET

74175

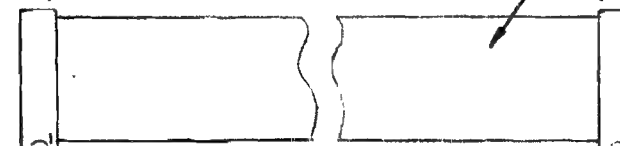
7454



REVISONS			SOUND HOLE "PAVE 2000"		
NO.	DATE	BY			
1			FIR ELECTRONICS CO		
2			SOUTHAMPTON PA 18966		
3			DRAWN BY <u>JUB</u>	SCALE <u>NTS</u>	MATERIAL <u> </u>
4			CHK'D	DATE <u>6-26-75</u>	DRAWING NO.
5			TRACED	APP'D	<u>SM 101</u>



3H SCOTCHFLEX DIP CONNECTOR #3416
3H SCOTCHFLEX CABLE #3365-16



REVISIONS			SET POINT MODULE "PAVE 2000"		
NO.	DATE	BY			
1			PAC ELECTRONICS CO		
2			SOUTHAMPTON PA 18966		
3			DRAWN BY <i>LJB</i>	SCALE <i>NTS</i>	MATERIAL <i>—</i>
4			CHK'D	DATE <i>7-16-75</i>	DRAWING NO.
5			TRACED	APP'D	<i>A-504</i>

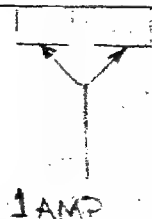
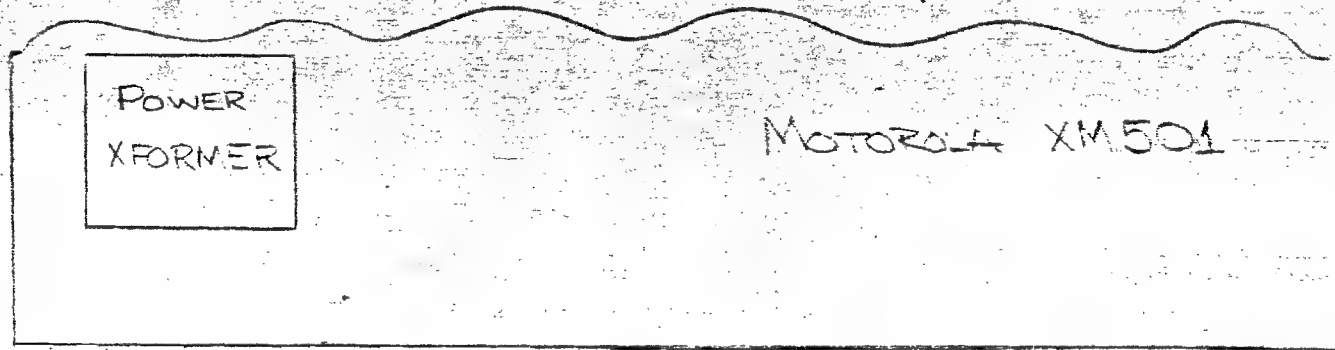
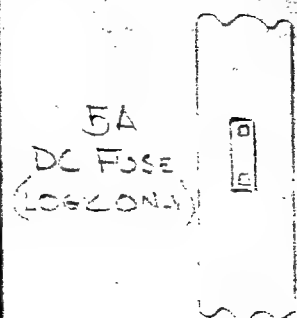
PRINCESS - 10V Power Supply Parts List

PRINCESS Sound Board

Unit Qty.	DESCRIPTION	Unit Qty.	DESCRIPTION	Unit Qty.	DESCRIPTION
1	Power Tx 20VCT 220 MA	8	AINS - AMP #60618-1	1	74175 IC
1	1/2 A FUSE 3 AG	8	SOCKETS - AMP #60617-1	1	7454
1	ELECT CAP 8000 uF 16V	1	AIN HOUSING AMP #1-480432-0	1	16 Pin IC Socket
2	Diode 1N4001	1	SOCKET HOUSING #1-480431-0	2	16 Pin DR PLUG
1	RESISTOR 20 Ω 5W	1	1/4" GROUND	1	PC BOARD
1	ZENER Diode 10V 5% 2W	40"	#22 AWG STD WIRE		
1	CAP .1 uF 12V DISC	2	FUSE CLIP ^{LITTLE FUSE} #102068		FREE GAME HEADER
1	PC BOARD			1	16 Pin Socket
				1	1 K Ω RESISTOR
	SET POINT MODULE				PADDLE MODULE
1	PC BD - SP 100			1	7432 IC
1	SN 74157			1	7402 IC
1	BECKMAN RES PACK 898-1-RIK			2	.1 uF CAP DISC 12V
1	Socket (DIP) 16 Pin			1	Socket (DIP) 16 Pin
1	ECCO STRIPSWITCH #2 A215012G			2	3m SCOTCH FLEX Conn. #3416
2	3m SCOTCH FLEX CONNECTOR #3416			6"	" " CABLE #3365-16
6"	" " CABLE #3365-16				

PRINCESS Logic BOARD PARTS LIST

Unit Qty.	DESCRIPTION	Unit Qty.	DESCRIPTION	Unit Qty.	DESCRIPTION
1	PC BD.	1	74153 IC	1	1N4001 Diode
1	4040/4004 IC	2	74157	3	1N914 Diode
1	4289 IC	2	74175	4	SGC 7253
1	4002-1	16	74191	1	2N5139
1	4201	1	74368/8T98		
3	4702-A	5	825126	2	24PF MICA CAP.
1	7400	5	555	1	100PF MICA
3	7402	2	7474 IC	1	.001 uF DISC
2	7404	1	7425	4	.01 uF MYLAR
1	7406	1	8MHz CRYSTAL	50	.01 uF DISC
3	7407	1	5.185 MHz	1	.47 uF DISC
5	7408			3	4.7 uF ELECT.
1	7420	2	6K Ω RES. ^{16 Pin} PAC (BECKMAN)	1	220 uF ELECT.
1	7427	2	1K Ω " " "		
2	7432			4	24 Pin IC Socket
1	7454	9	100 Ω $\frac{1}{4}$ W 5% RES.	12	16 Pin " "
2	7486	4	330 Ω	1	40 Pin IC "
1	7489	5	1K Ω		
2	7412	1	47 Ω		
4	74150	1	1M Ω		
1	74153	1	5mk P.T		
4	74154	1	10K Ω RESISTOR		



CONTRAST
BRIGHTNESS

VERT
HOLD

VOLUME
HORIZ. HOLD

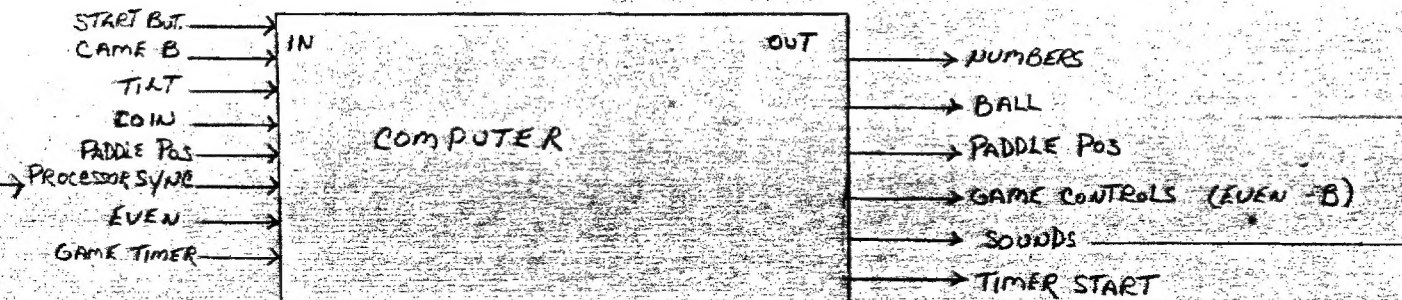
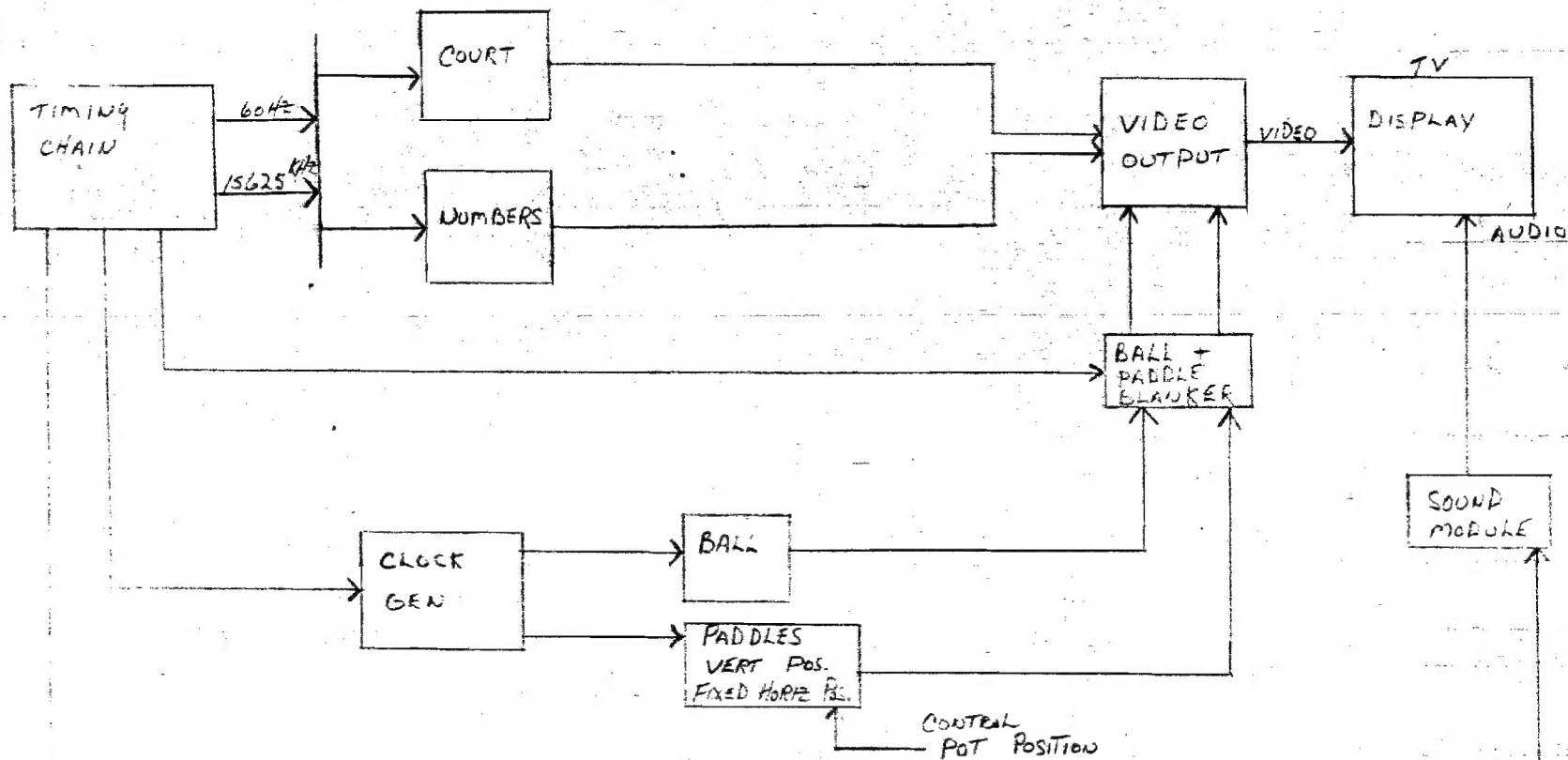
VIEW FROM CASH BOX DOOR OPEN

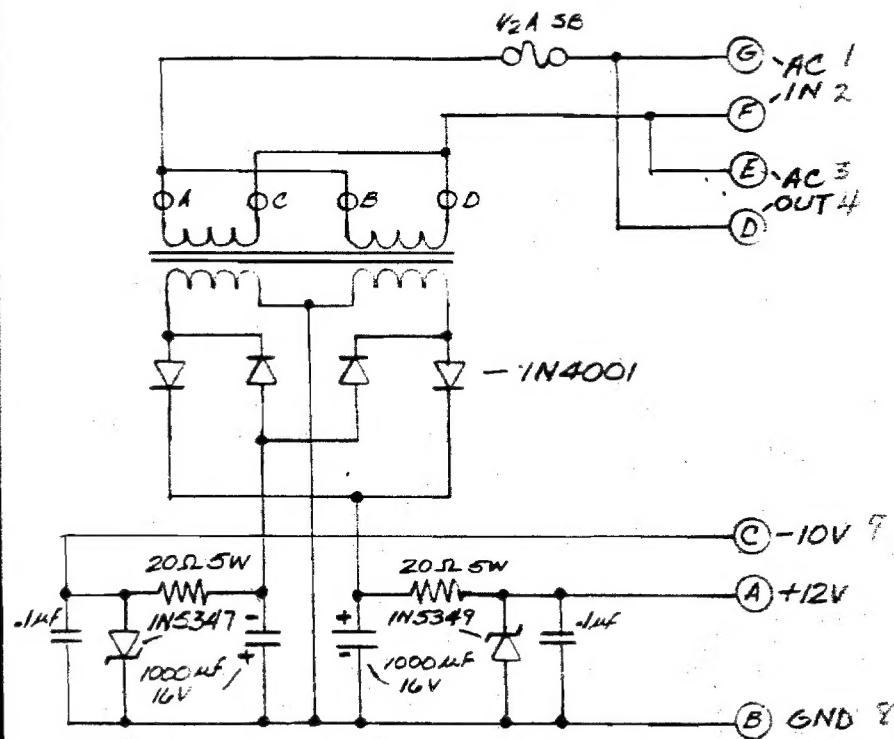
SERVICE NOTES -

1. TO OPEN TABLE TOP, REACH INSIDE CASH BOX DOOR & RELEASE LATCH ON UPPER RIGHT HAND SIDE.

2. TO EMPTY CASH BOX REMOVE SHIPPING SCREW LOCATED IN LOWER RIGHT HAND CORNER OF CASH BOX DOOR.

REVISIONS			COCKTAIL CABINET - MONITOR ADJUSTMENTS		
NO.	DATE	BY	PMC ELECTRONICS CO. INC.		
1			DRAWN BY <i>GAC</i> CHK'D TRACED SCALE <i>✓</i> DATE APP'D MATERIAL DRAWING NO. CC-108-A		
2					
3					
4					
5					





8 Pins Amp # 65618-1

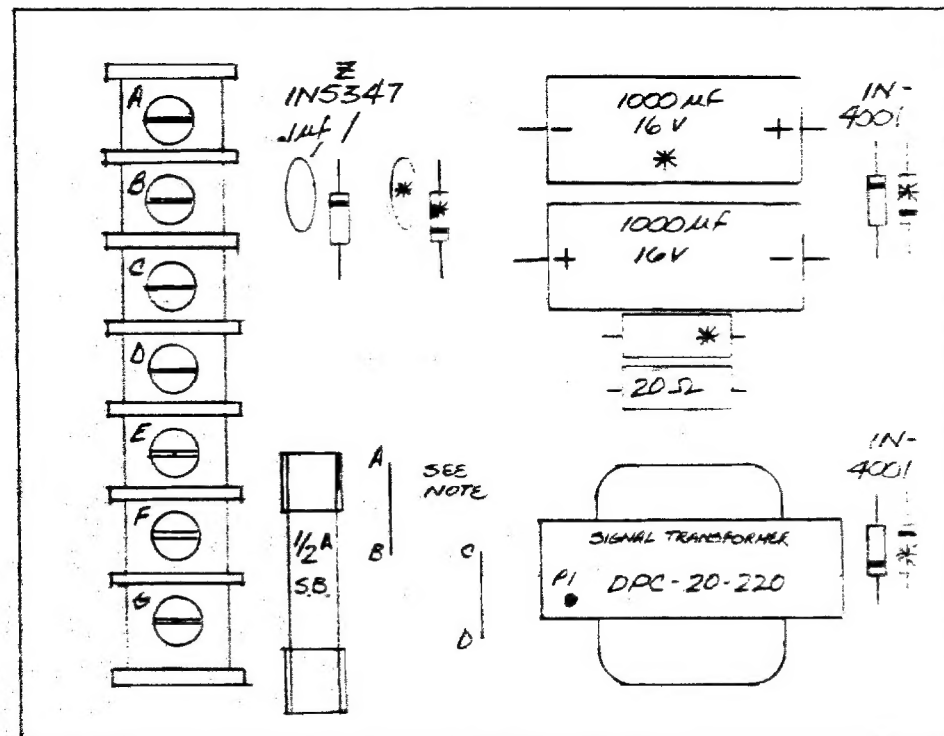
8 Sockets Amp # 65617-1

1 Pin Housing Amp # 1-480432-0

1 Socket Housing Amp # 1-480431-0

6 20 AWG - STD - 6" Long

1 1/4" GROMMET



110V - JUMPER A TO B & C TO D

220V - REMOVE A TO B & C TO D - JUMPER B TO C

* - FOR OPTIONAL +12 V POWER SUPPLY

REVISIONS			POWER SUPPLY - 10V & +12 "PAVE 2000"		
NO.	DATE	BY			
1			FMC ELECTRONICS CO INC SOUTHAMPTON PA 18966		
2					
3			DRAWN BY JJB	SCALE NTS	MATERIAL —
4			CHK'D	DATE 6-26-75	DRAWING NO.
5			TRACED	APP'D	PS-106

REF. NO.	PART NUMBER	DESCRIPTION	REF. NO.	PART NUMBER	DESCRIPTION
ELECTRICAL PARTS			COILS & CHOKES		
	1Y25017A01	MONITOR PANEL: complete; KT364LM	L-1	24D68822A08	HORIZ SET
	1Y25017A02	POWER, Audio Panel: complete; KT365LM	L-2	24D68801A67	COMPENSATING: 2000 uh
CAPACITORS			L-3	24D69163A18	HORIZ LINEARITY
			L-4	24V25000A74	HORIZ WIDTH: Incls C42 & R68
			L-5	24D68523A15	DEFLECTION YOKE
C-1	23C65282A41	50 mf 50V Lytic	TRANSISTORS		
C-2	23C65282A41	50 mf 50V Lytic	Q-1	48S137171	1st VIDEO: A6H
C-3	21S180D10	220 pf 20% 100V X5F (Use 21R132503)	Q-2	48S137127	2nd VIDEO: P2S
C-4	23C65282A41	50 mf 50V Lytic	Q-3	48S134919	VIDEO OUTPUT: A1M
C-5	21S180B98	180 pf 10% 500V X5F	Q-4	48S137317	VIDEO DRIVER: A8H
C-6	23S10255A78	470 mf 16V Lytic	Q-5	48S137115	SYNC SEPARATOR: A5U
C-7	21S180CQ1	680 pf 10% 500V X5F	Q-6	48S137172	HORIZ OSCILLATOR: A6J
C-8	21S180B85	560 pf 10% 500V X5F	Q-7	48S137127	HORIZ PULSE SHAPER: P2S
C-10	8S10191B67	22 mf 10% 250V Polyester	Q-8	48S137093	HORIZ DRIVER: A5F
C-11	8S10191A54	.0068 mf 10% 160V Polyester	Q-9	48S137203	HORIZ OUTPUT: A6Z
C-12	21S180D10	220 pf 20% 100V X5F (Use 21R132503)	Q-10	48S137173	VERT OSCILLATOR (1): P2W
C-13	21S131625	330 pf 10% X5F	Q-11	48S137171	VERT OSCILLATOR (2): A6H
C-15	21S180C41	.0027 mf 10% 500V Z5F (Use 21K121699)	Q-12	48S137115	VERT DRIVER: A5U
C-16	23S10229A07	1.0 mf +40-20% 15V Lytic (Use 23C43280A17)	Q-13	48S134900	VERT OUTPUT: A1C
C-17	8S10191B90	.033 mf 10% 160V Polyester	Q-14	48S134952	REGULATOR DRIVER: A2J
C-18	8S10299A73	.01 mf 10% 100V Poly carb	Q-15	48S137315	REFERENCE AMP: A8G
C-19	8S10299A74	.0082 mf 10% 160V Poly carb	Q-16	48S137368	REGULATOR: A8W
C-20	8S10191B98	.01 mf 10% 250V Polyester	Q-17	48S137172	AUDIO DRIVER: A6J
C-21	21S180B51	.001 mf 10% 500V X5F	Q-18	48S137168	AUDIO OUTPUT: P2V
C-22	8S10191B98	.01 mf 10% 160V Polyester	Q-19	48S137169	5V REGULATOR, Driver: A6G
C-23	21S180C02	10 pf 10% N150	Q-20	48S137344	5V REGULATOR: A8U
C-24	23D65282A40	150 mf 10V Lytic	Q-21	48S137476	SPOT KILLER: B1E
C-25	21S180B51	.001 mf 10% 500V X5F	CONTROLS		
C-26	8S10212B53	.47 mf 10% 630V Mtlz Poly	R-5	18D68222A34	CONTRAST: 250 Ohm
C-27	8S10212A11	1.0 mf 10% 630V Mtlz Poly	R-10	18D66401A44	VIDEO BIAS: 4K
C-28	8S10571A06	.01 mf 5% 1200V Poly Prop Foil	R-17	18D67858A12	FOCUS: 2 meg
C-29	8S10571A23	.56 mf 10% 250V Mtlz Prop Foil	R-21	18D68222A35	BRIGHTNESS: 200K
C-30	8S10191A32	.047 mf 10% 250V Polyester	R-34	18D68222A37	HORIZ HOLD: 25K
C-31	21S180B87	220 pf 10% 500V X5F	R-59	18D66401A44	VERT LINEARITY: 4K
C-32	21S180D34	.005 mf 20% 1KV Z5F (Use 21S180D31)	R-65	17D65820A38	VERT SIZE: 15 Ohm
C-33	8S10212A69	.47 mf 10% 100V Mtlz Poly	R-74	17D65820A37	REGULATOR ADJUST: 2K
C-34	8S10191A32	.047 10% 250V Polyester	R-82	18D68222A36	VERT HOLD: 3K
C-35	8S10191B98	.01 mf 10% 250V Polyester	R-85	18D68222A34	VOLUME: 250 Ohm
C-36	23S10255A69	4.7 mf 100V Lytic	RESISTORS		
C-37	8S10212A20	2.2 mf 10% 100V Mtlz Poly	R-1	6S127633	470 10% 1/2W
C-38	8S10212A20	2.2 mf 10% 100V Mtlz Poly	R-2	6S125568	22K 10% 1/2W
C-39	8S10191B67	.22 mf 10% 250V Polyester	R-3	6S127541	56K 10% 1/2W
C-40	8S10212A10	1.0 mf 10% 100V Mtlz Poly (Use 8S10191A46)	R-4	6S127633	470 10% 1/2W
C-41	8S10064A06	.01 mf 10% 600V Mylar	R-6	6S128955	1500 10% 1W
C-42	21S180A71	470 pf 10% 500V X5F	R-7	6S121847	4700 10% 1/2W
C-43	23C65807A47	400 mf/125V; 600 mf/50V; 20 mf/200V Lytic	R-8	6S122445	1800 10% 1/2W
C-44	21S180E60	.01 mf +80-20% 50V Z5V	R-9	6S119926	2700 10% 1/2W
C-47	*23C65807A52	5000 mf 20V Lytic	R-11	6S128226	120 10% 1/2W
C-49	23S10255A31	470 mf 40V Lytic	R-12	6S127633	470 10% 1/2W
C-50	23D65282A41	50 mf 50V Lytic	R-13	17S10731A02	7500 5% 5W WW
C-51	23S10255B43	40 mf 100V Lytic	R-14	6S124797	150 10% 1/2W
DIODES & RECTIFIERS			R-15	6S127516	82 10% 1/2W
D-1	48S134921	DIODE, Silicon: D1D; Damper	R-18	-----	Part of CRT socket assembly
D-2	48S134978	DIODE, Silicon: D1K; Pulse Limiter	R-19	-----	Part of CRT socket assembly
D-3	48D67120A11	DIODE, Low Power	R-20	-----	Part of CRT socket assembly
D-4	48S137114	RECTIFIER, H. V.: Silicon; D2Y	R-22	6S129296	270K 10% 1/2W
D-5	48S191A05	RECTIFIER, Silicon: 91A05 (Use 48S191A07)	R-23	6S10053C67	27K 5% 1/2W
D-6	48S137469	DIODE, Silicon: zener; D7G	R-24	6S127538	3.3 meg 10% 1/2W
D-7	48S134917	DIODE, Dual: D1C; Detector	R-25	6S121300	27K 10% 1/2W
D-8	48S67120A11	DIODE, Low Power	R-26	6S127541	56K 10% 1/2W
D-9	*48S191A10	RECTIFIER, Silicon: 91A10	R-27	6S129875	2200 10% 1/2W
D-10	48S191A10	RECTIFIER, Silicon: 91A10	R-28	6S125531	180K 10% 1/2W
D-11	48S101A10	RECTIFIER, Silicon: 91A10	R-29	6S125531	180K 10% 1/2W
D-12	48S191A10	RECTIFIER, Silicon: 91A10	R-30	6S125892	47K 10% 1/2W
D-13	48D67120A11	DIODE, Low Power	R-31	6S125534	100K 10% 1/2W
D-14	48S191A05	RECTIFIER, Silicon: 91A05 (Use 48S191A07)	R-32	6S124506	3300 10% 1/2W
D-15	48S191A05	RECTIFIER, Silicon: 91A05 (Use 48S191A07)	R-33	6S10053C53	6800 5% 1/2W
D-16	48S191A05	RECTIFIER, Silicon: 91A05 (Use 48S191A07)	R-35	6S127541	56K 10% 1/2W
D-17	48S191A05	RECTIFIER, Silicon: 91A05 (Use 48S191A07)	R-36	6S125545	390 10% 1/2W
D-18	48S191A05	RECTIFIER, Silicon: 91A05 (Use 48S191A07)	R-37	6S121301	1000 10% 1/2W
D-19	48D67120A11	DIODE, Low Power	R-38	6S10053C33	1000 5% 1/2W
D-20	*48S10641D43	DIODE, Silicon: D4.3	R-39	6S127516	82 10% 1/2W
D-21	48D67120A11	DIODE, Low Power	R-40	6S127547	1000 10% 1W
D-22	48S191A05	RECTIFIER, Silicon: 91A05 (Use 48S191A07)	R-41	6S127099	220 10% 1/2W
D-23	48S191A05	RECTIFIER Silicon: 91A05 (Use 48S191A07)	R-42	6S127513	1500 10% 1/2W
FUSES			R-43	17S10130B07	1500 10% 3W fxd mtl film
F-1	65S139424	FUSE: 1A-250V	R-44	17S744356	2.2 10% 2W WW
F-2	65S139424	FUSE: 1A-250V	R-45	6S120141	150K 10% 1W
INTEGRATED CIRCUITS			R-46	6S127634	33K 10% 1W
IC-1	*51S10732A01	INTEGRATED CIRCUIT: T3F	R-47	6S128229	680K 10% 1/2W
			R-48	6S10053D21	4.7 meg 10% 1/2W
			R-49	6S124797	150 10% 1/2W
			R-50	6S10053C45	3300 5% 1/2W
			R-52	6S124506	3300 10% 1/2W
			R-53	6S129874	68 10% 1/2W
			R-54	6S131972	39 10% 1/2W
			R-55	6S10053C65	22K 5% 1/2W
			R-56	6S125535	39K 10% 1/2W
			R-57	6S124506	3300 10% 1/2W
			R-58	6S129793	82K 5% 1/2W
			R-60	6S129875	2200 10% 1/2W
			R-61	6S10053F29	820 10% 1W
			R-62	6S127515	3900 10% 1/2W

REPLACEMENT PARTS LIST

REF. NO.	PART NUMBER	DESCRIPTION	REF. NO.	PART NUMBER	DESCRIPTION
R-63	6S121301	1000 10% 1/2W		50V25008A22	SPEAKER; 4" PM; incls D22
R-64	17S10130C91	10 10% 1/2W (special)	E-1	65S139451	LAMP; No. 1436
R-66	6S129064	4700 10% 1W			
R-67	6S122848	18K 10% 1/2W			
R-68	6S124797	150 10% 1/2W			
R-69	17S647132	1200 10% 5W WW (Use 17S136197)			
R-71	6S119926	2700 10% 1/2W			
R-72	6S124551	15K 10% 1/2W		9D66133A28	CAP, SS Rect (HV Transformer - PRI/SEC lead)
R-73	6S129875	2200 10% 1/2W		42B25158A01	CLAMP, Metal; Defl Yoke Mtg
R-75	6S121301	1000 10% 1/2W		31D70080B04	CONNECTOR, PC panel; 9 contact; on chassis
R-76	6S124506	3300 10% 1/2W			
R-77	6S129221	100 10% 1/2W	S-2	*15S10390A06	CONNECTOR, PC panel; 12 contact; less key and contacts (power-audio panel)
R-78	6S127005	5600 10% 1/2W	P-1	*16S10183A69	CONNECTOR, Plug; 12 contact; less contacts (power)
R-79	17S135589	150 10% 10W WW			
R-81	6C66263A08	VARIATOR (Use 6S66263A16)			
R-86	6S127099	220 10% 1/2W			
R-88	6S121301	1000 10% 1/2W			
R-89		Part of CRT Socket		*39S10184A63	CONTACT, Plug; for power connector 15S10183A69
R-90	6S131412	56 10% 1/2W			
R-91	6S10053C39	1800 5% 1/2W		39S10184A22	CONTACT; for S2 connector
R-92	6S10053C57	10K 5% 1/2W		15S10630A01	COVER, nylon; slide switch; SW1
R-95	6S125568	22K 10% 1/2W		*7S10609A03	GROMMET, Plastic; PC panel mtg
R-96	6S125568	22K 10% 1/2W		26C66745A05	HEAT SINK; Q3
R-97	6S121847	4700 10% 1/2W		*26C25198A01	HEAT SINK; Q20
R-98	6S127099	220 10% 1/2W		9C66238A02	HOLDER, Fuse; F1 & F2
R-99	6S128226	120 10% 1/2W		14A562353	INSULATOR, Mica; Transistor socket; Q9, Q13, Q16 & Q20 (Use 14A543810)
				28S10733A01	KEY, Plug; for S2 connector
				2S7051	NUT, hex; 3/8-32; control mtg
				5S10281A03	RIVET, drive pin; nylon; HV transf mtg
				47C66082A03	ROD, Adjustment; width coil; L4
				3S136050	SCREW, tpg; 6-20 x 1/2 clu pan hd; Q9, Q13, Q16 & Q20
				9S10143A41	SOCKET, lamp; E1
				9D67555V27	SOCKET, CRT; incls leads & resistors
				*9D25201A01	SOCKET, HV Rectifier (4); complete; incl 2nd anode lead & cup
				9C63825A01	SOCKET, transistor; Q9, Q13, Q16
				9C63825A02	SOCKET, transistor; Q20
				41D65987A01	SPRING, special; CRT aquadag grnd
				66P65173A47	TOOL, contact removal (S2 connector)
SWITCHES			MECHANICAL PARTS		
SW-1	40S10624A01	SWITCH, Slide: DPDT (115V-230V)			
TRANSFORMERS					
T-1	25D67440A03	HORIZ DRIVER			
T-2	24D69791A21	H. V. TRANSFORMER; complete			
T-3	25D65840A22	VERT OUTPUT (Use 25D65840B23)			
T-4	*25D68164A31	POWER			
MISCELLANEOUS ELECTRICAL PARTS					
V-1	20WP4	CRT (XM501-10 19VP111)			
	23JEP4	CRT (XM701-10 23VP111)			

* DENOTES NEW ITEM APPEARING ON ANY LIST FOR FIRST TIME.